Field Test Overview

An Assessment of Geological Carbon Sequestration Options in the Illinois Basin

presented by
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MGSC Project Team

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Midwest Geological
Sequestration Consortium
www.sequestration.org

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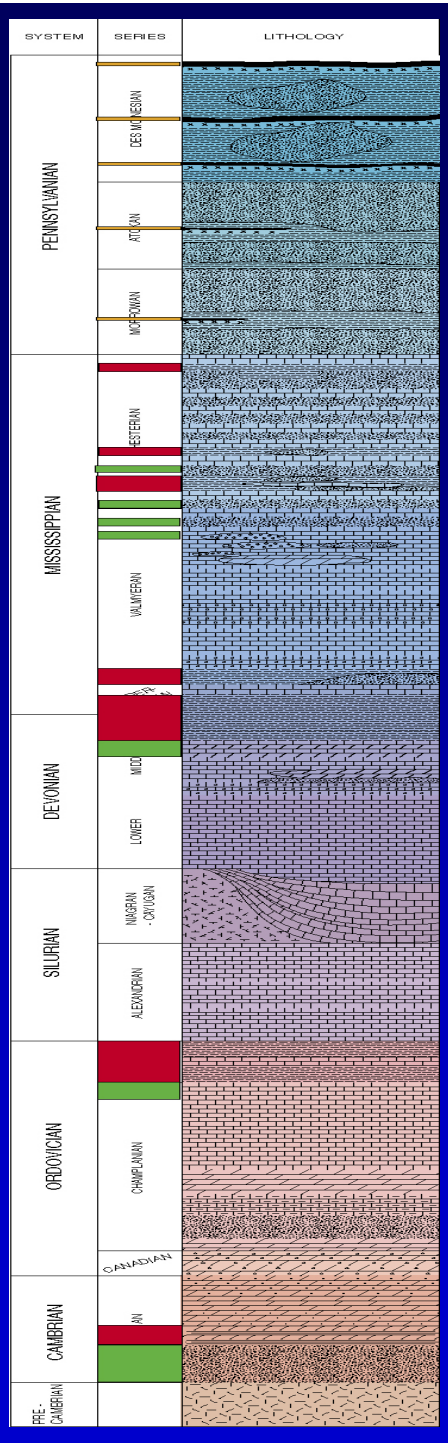
- The MGSC is a collaboration led by the geological surveys of Illinois, Indiana, and Kentucky



Pennsylvanian coal seams

adsorption on coal

Mississippian sandstone and carbonate oil reservoirs

CO_2 EOR in mature fields

New Albany Shale

adsorption on shale

Maquoketa Shale

St. Peter Sandstone

Eau Claire Shale

Mt. Simon Sandstone

major saline reservoirs

Potential Seal

Potential Sink

Coal Bed
Potential Sink
and Seal

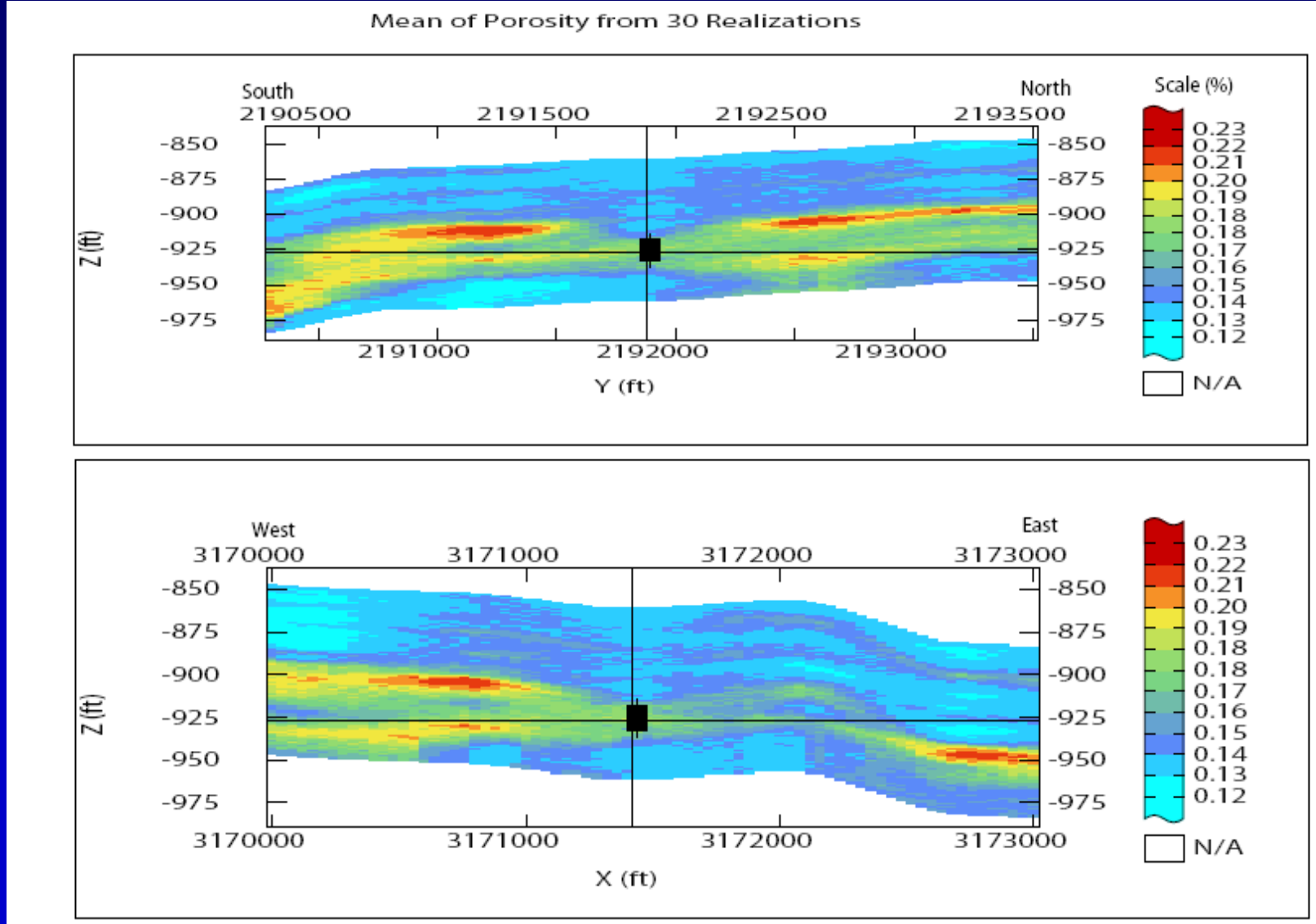
from Leetaru, 2004

Inject/Soak/Produce ("Huff 'n Puff") Field Test, Loudon Field, Fayette Co., Illinois

- Use single oil producing well to alternate CO_2 injection and oil production
- CO_2 injected as a gas (immiscible)
- Quantify in-situ PVT properties of reservoir oil (laboratory)
- Optimize injected volume and soak time via compositional reservoir simulation (VIP)
- Carry out environmental monitoring

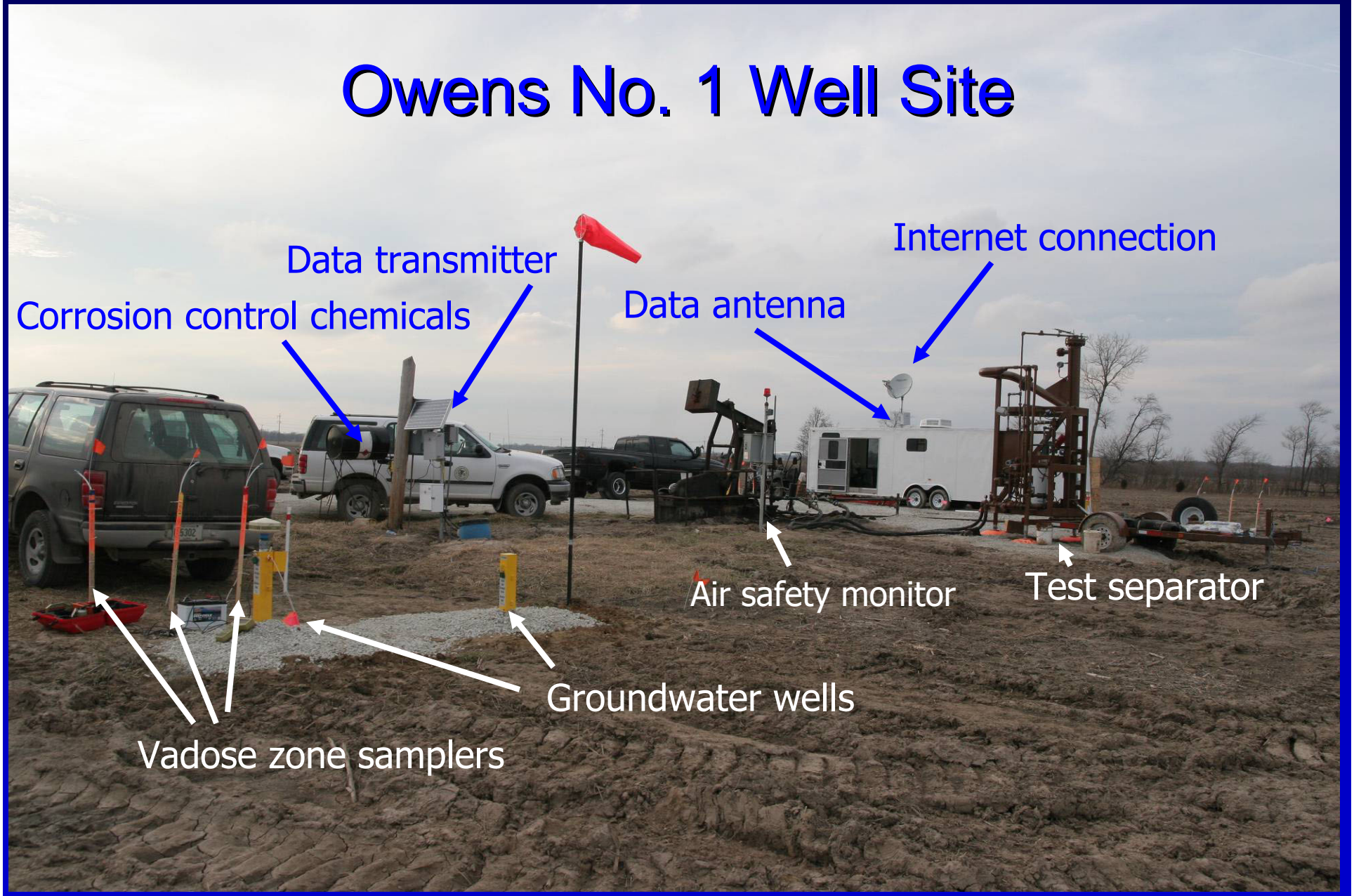
Porosity Model for Huff 'n Puff Test Site

Cypress (Weiler) Sandstone, Loudon Field



Huff n' Puff Owens No. 1 Well Site

Owens No. 1 Well Site



CO_2 Supply Site for Owens No. 1

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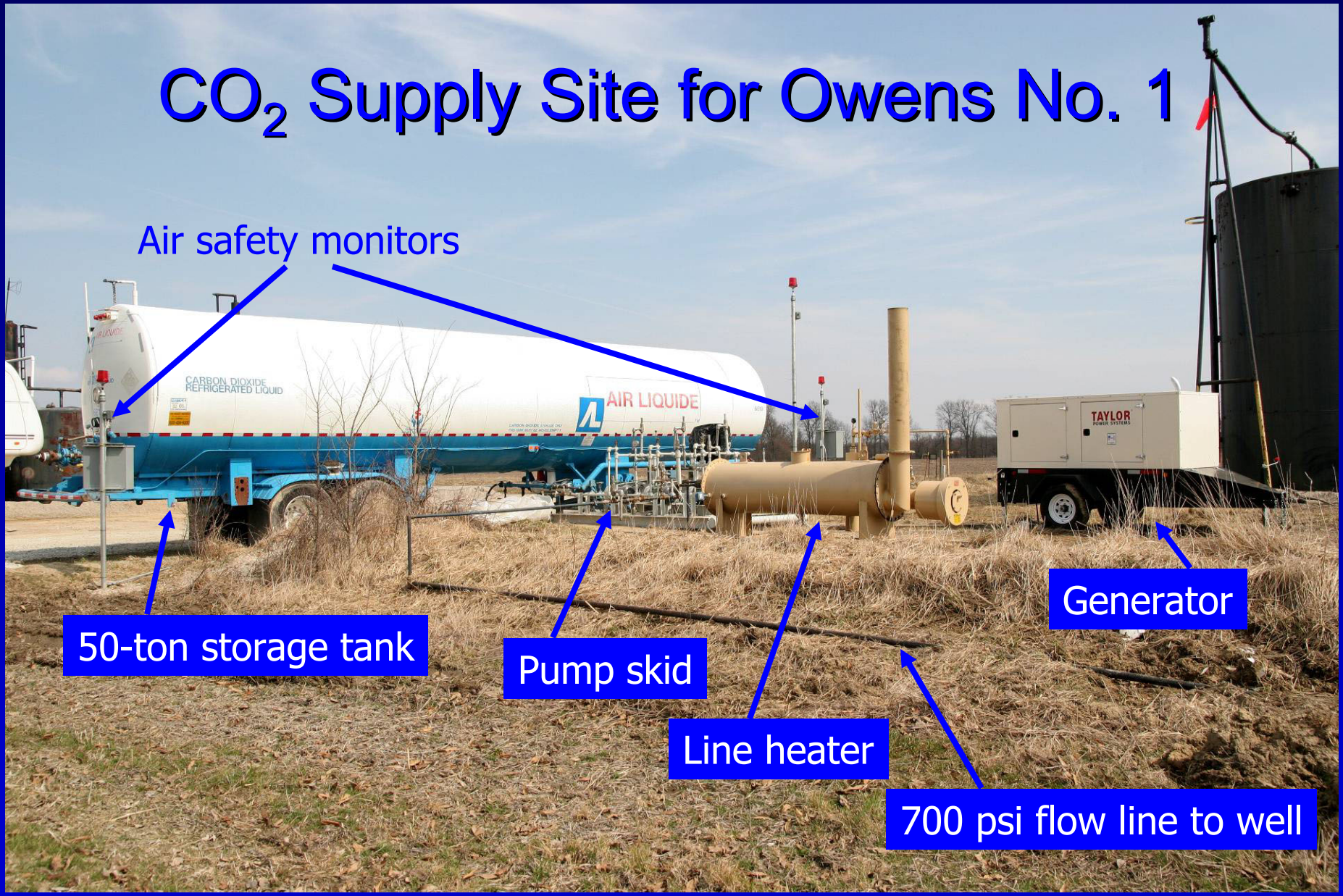
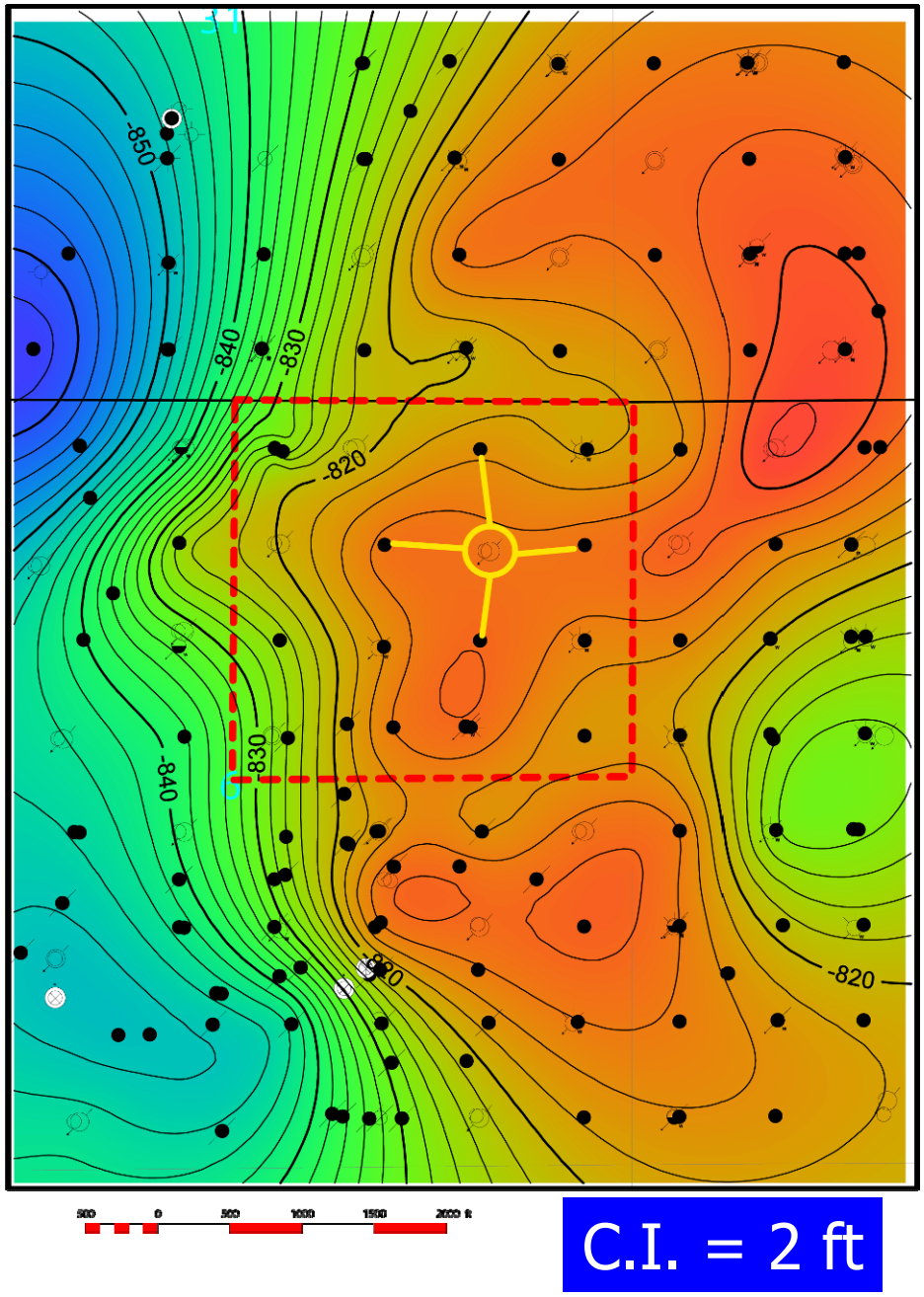


Owens No. 1 Huff ‘n Puff Outcome

- Preinjection production of 2 bbls oil/day and ~ 50 bbls water
- 43 tons CO_2 injected week of March 19, 2007
- Production increased to 8 bbls/day for a few days, declined to 5-6 bbls rapidly
- Holding at 3-4 bbls oil day, water dropped 50 percent
- Volumetric data on CO_2 produced vs. retained being accumulated and interpreted



C.I. = 2 ft

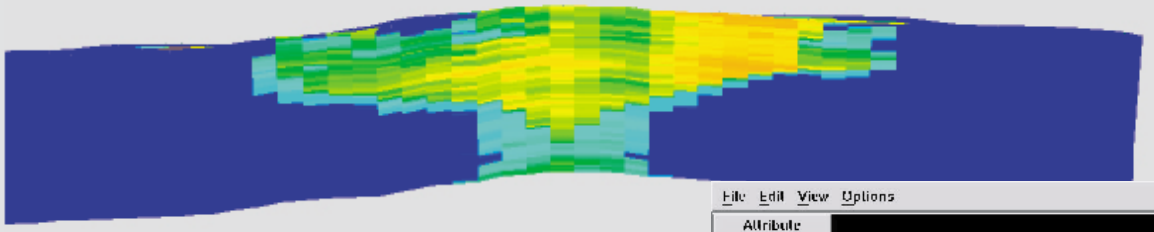
Immiscible Pattern Flood Hobbs Lease, Loudon Field

- 160 acre lease with a water injector and four surrounding producers
- Injector will be converted to CO_2
- About 2,500 tons to be injected starting in July 07

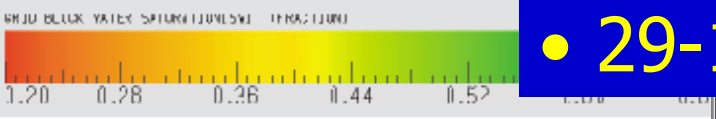
Coal Seam Injection Site Wabash County, Illinois

- Springfield Coal
  - > 6 feet thick
  - ~ 920 feet deep
- COMET modeling used to define
  - 3 wells, spacing - 150 feet (orthogonal), wells to be drilled early July 2007, desorption and core tests to follow
- Surface injection March 08:
  - Injection volume- up to 700 tons CO_2
  - Injection duration- 20 to 30 days

Mt. Simon Sandstone



80 years of injection
40 years shut-in

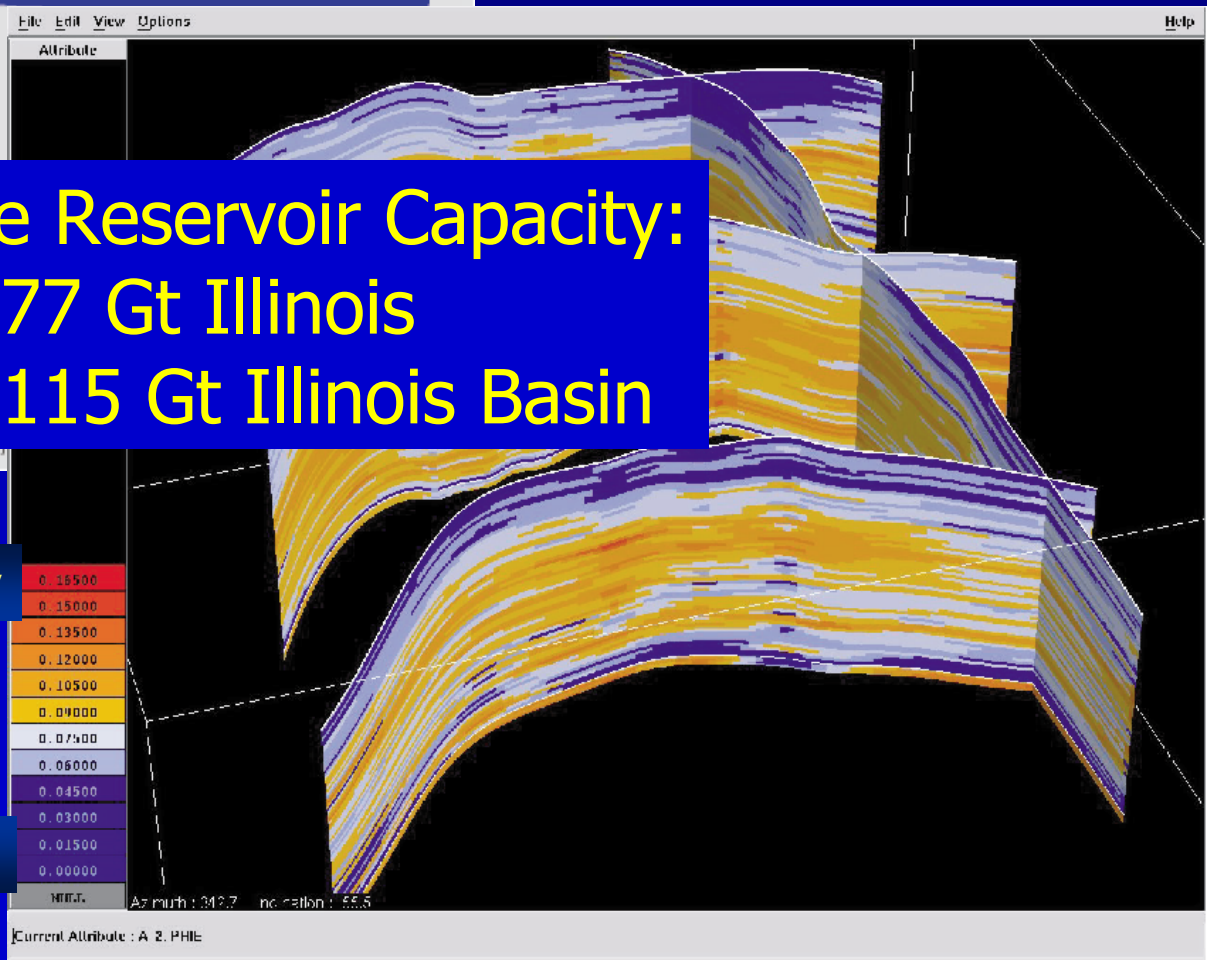


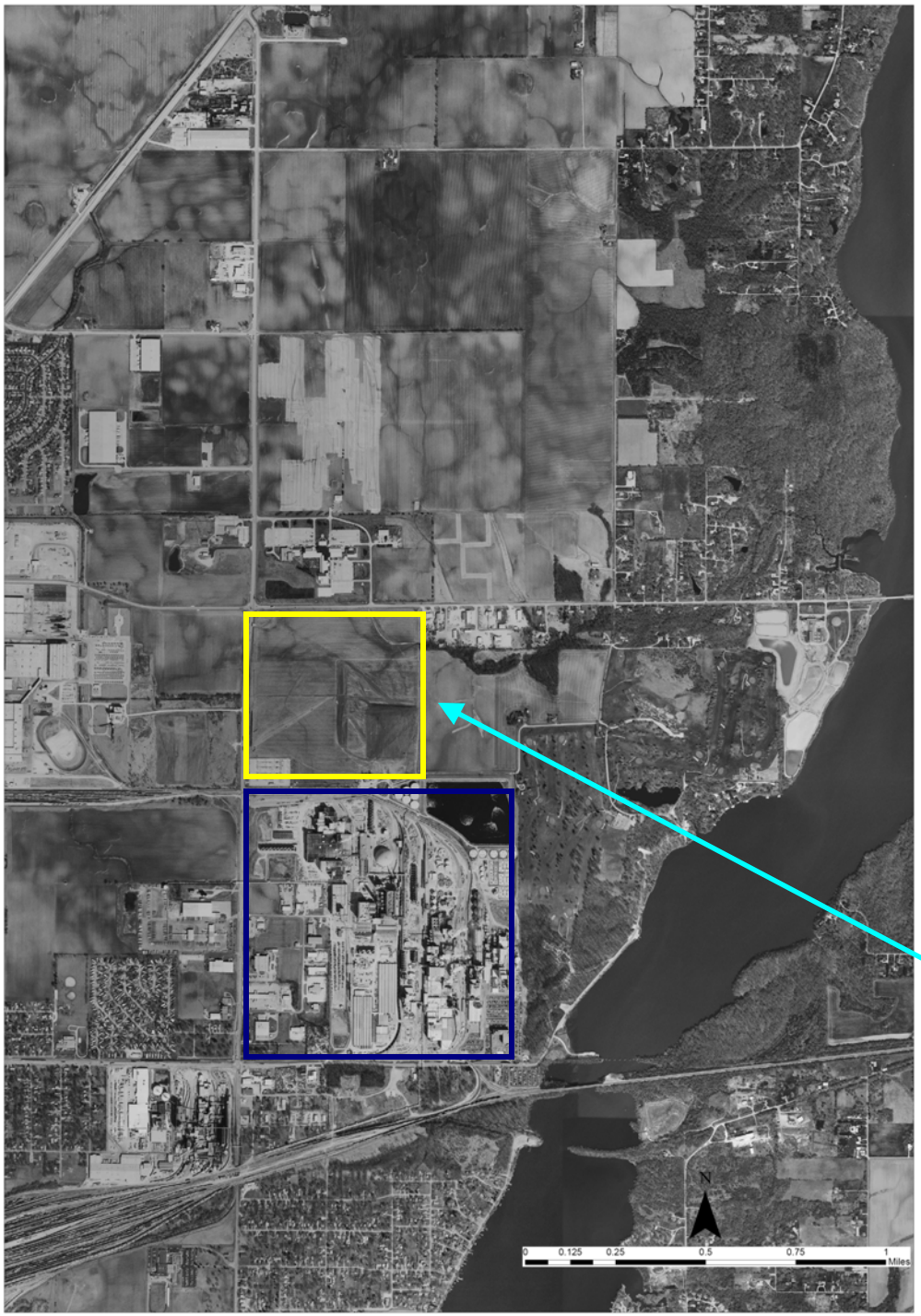
Saline Reservoir Capacity:

- 19-77 Gt Illinois
- 29-115 Gt Illinois Basin

High Porosity

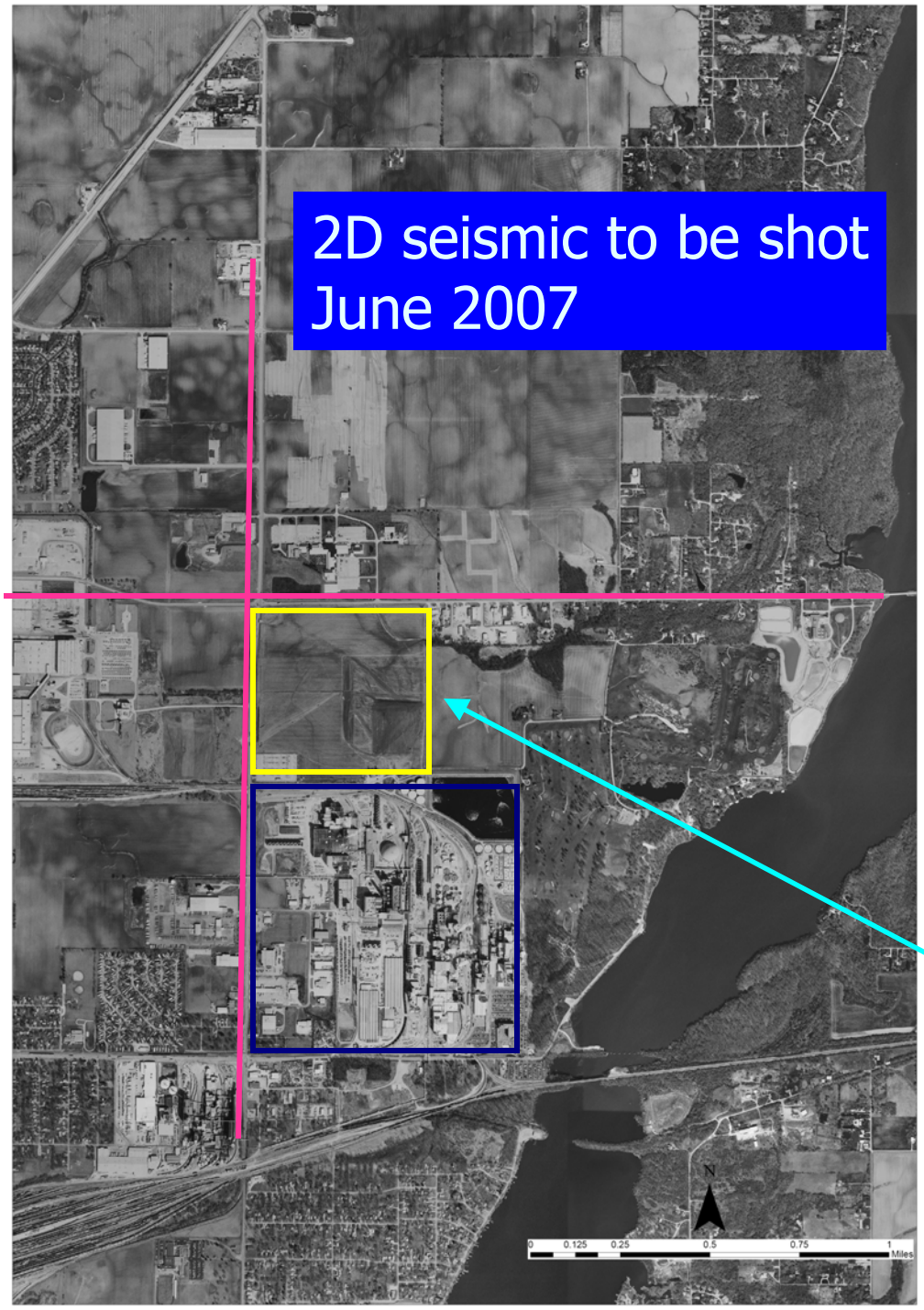
Low Porosity





Archer Daniels Midland Company Site

- Facility processes agricultural products, produces ethanol, and is the ADM corporate headquarters
- ADM owns several surrounding tracts in addition to plant site
- Injection tract is about 3,000 x 3,000 ft immediately north of the plant



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